QZX

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EDITOR'S NOTES

K5XY

One of our advertisers is missing. Indeed another of the Sinclair family of product sellers has gone.

Some will have noticed that the advertisement for T&C Services was not in the last issue of QZX. That business has disappeared into the woodwork. The telephone number which has graced the pages for more issues than I care to count is being answered by people who have not heard to that long time QZX advertiser. This particular business will be missed because their advertisement is the longest running advertisement for Sinclair products in the world. Their support for QZX has been an important factor in keeping the publication alive and is much appreciated.

But while one goes another comes, this time with a rare but essential part. Nazir A. Pashtoon under the name of NAP_WARE is selling all Timex or QL programmable array logic chips. These are IC chips which look like easily available chips but are not. For details of the contents of the ZX81 PAL, as they are called, see previous issues of QZX. For details on the new business (located near Chicago) call (708) 439-1679 in the evenings.

The Capital Area Timex/Sinclair Users Group (CATS) has recently obtained some very useful file compression programs for the QL. They have been added to the disks in their library. Three programs, ZOO, HAR, and LHX are available. These are archiving programs, much like the well known PKZIP used in the MSDOS world. These three programs are used on a variety of systems. All three allow you to pack a number of files into a single compressed file or to just compress a large file.

File compression is great fro uploading a large file or a number of files as one file to a BBS or for a packet exchange. they also compress QSL programs and logs to save disk space.

All the programs come with source code to make it convenient for those who want to study the file compression algorithm or tinker with the programs.

The group also has a copy of QLUNZIP, a program for the QL which will unzip files that have been archived using PKZIP. This is a popular program used on packet to reduce the transmission time and to lessen the chance that a collision will slow the transfer.

You can contact Tim Swenson, Box 11017, Takoma Park, MD 20913 for information on how to join CATS or otherwise get access to their library.

QZX must be doing something right. Almost 40% of a recent newsletter received here was made up of reprints from QZX. (Of course, part of that issue of QZX was made up of reprints too.)

The main article this month tells how to add an interface to the ZX81. This interface can be used for such

things as controlling beam antennas, switching equipment on or off. at selected times, activating packet equipment, or controlling automatic battery chargers. It is best to use buffer circuits on the output of the ZX81 as does this equipment because the unbuffered outputs have very little drive capabilities. This is a particularly good building project because it uses a Sinclair computer for a task for which another computer is too large and expensive. Furthermore the limited monitor and keyboard capabilities of the ZX81 are not important factors for I/O controllers.

BITS AND BYTES

178 Many magazines carry ads for clear plastic covers for IBM type keyboards to protect them from spills and greasy fingers. The TS2068 and TS1500 keyboards can be given much the same type of protection by laying a piece of plastic wrap such as Saran over them. The keyboard "feel" is preserved too.

179 Many of the new keyboards have a little raised bump on the letters F and J so that touch typists can feel when their fingers are on the home keys. You can fix our Sinclair keyboards in the same way by putting a little dot of clear plastic cement on these keys.

180 You can check a group of cheap 3 1/2 inch floppy disks by holding them horizontally in the palm of your hand and then shaking it gently while looking at the metal hub. It should slide around and rattle a bit. If the disk is one of those which are hard to turn and which may stall your disk drive, the hub will not move unless you shake it vigorously.

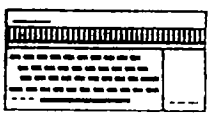
181 On the TS2068 with TMX disk system you get the important ^C keystroke by holding down BOTH shift keys and pressing C.

182 If the bottom of your ZX81 screen becomes all clogged up and the computer refuses to ENTER you command or instruction, the usual way out is to unplug the computer. However then you will lose the program you have been typing in. Try the following two commands:

EDIT (Shift 1)

ENTER

These two commands will clean up the bottom of the screen without losing the part of your program already typed in.



24 Line I/O

The circuit given on the following page is for an add-on board that will plug into the ZX81's rear connector and provide 24 bi-directional Input/Output lines. These could be used to control music synthesisers, model train layouts, or whatever you wish.

Because the ZX81 has 1K resistors in series with the data lines DØ-D7, which severely limit the possible DC and AC loading of these lines, a specialised MOS I/O chip has been used. This imposes virtually no DC load on the data lines and only a slight AC load. It is also an attractive choice because it is a very versatile IC, which can provide many types of I/O function.

As well as the 64K byte RAM/ROM address space, the Z80 processor can also use a separate, smaller, address space for I/O ports. However, this I/O address space cannot be accessed directly from BASIC using PEEK or POKE, but needs a machine language routine. To simplify matters, the I/O port described here has been put into the Z80's normal RAM/ROM address space, at locations C000 to C003 hex, where it will not interfere with the ZX81's 8K ROM or up to 16K RAM.

If your ZX81 has only the basic 1K of RAM, then pin 8 of IC3 on the I/O board should be connected to pin A2 of the ZX81 rear connector; the RAMCS line. If, however, you have an external RAM pack, then you should;

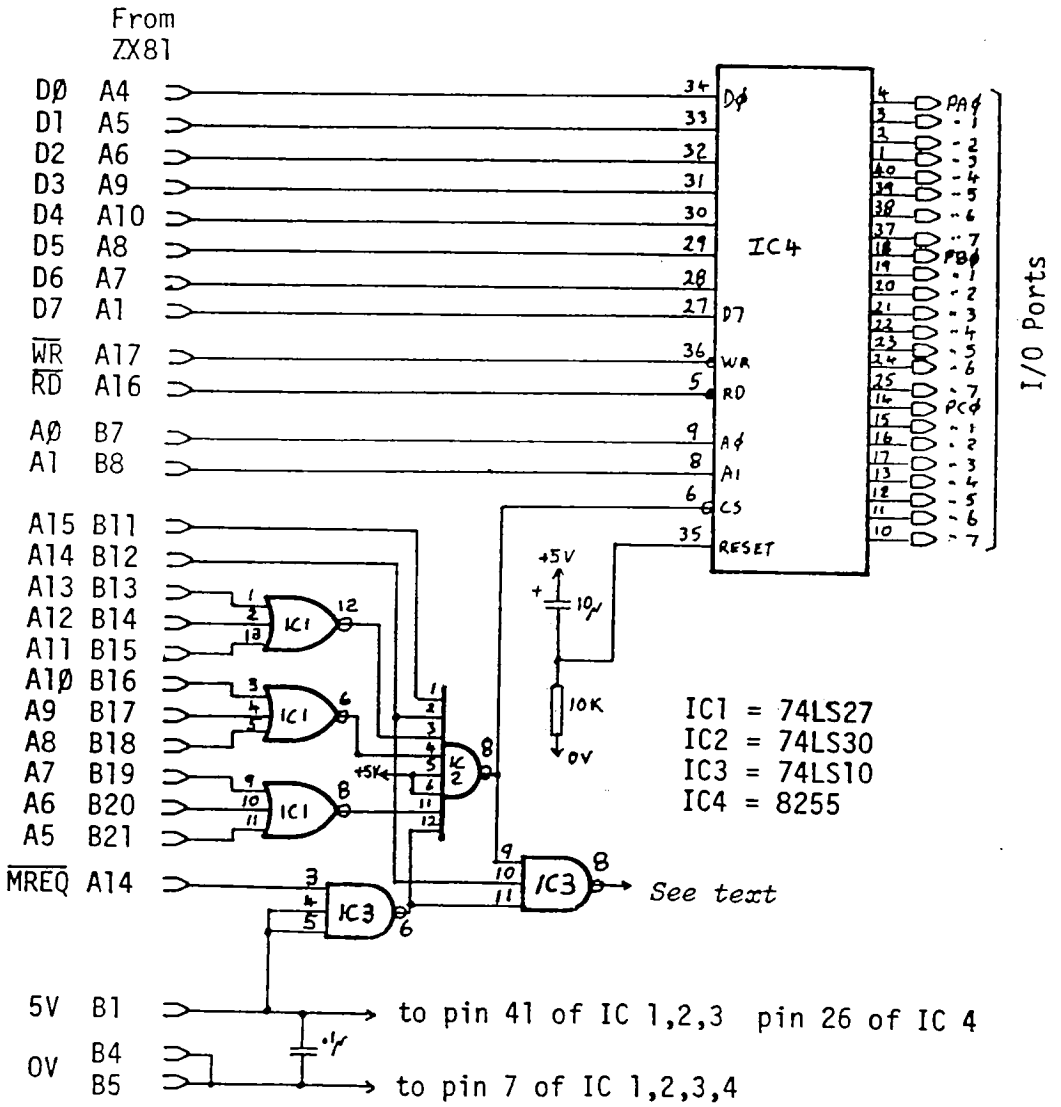
- Add a 23+23 way double sided plug to the I/O board so that the RAM pack can be plugged on. All pins *except for pin A14* on this plug should be wired to the corresponding pins of the I/O board's 23+23 way socket.
- Connect pin 8 of IC3 on the I/O board to pin A14 of the plug which will mate with the RAM pack.

If you have a printer then this can be connected between the ZX81 and the I/O board.

The following paragraphs summarise the main features of the 8255 Programmable Peripheral Interface chip, giving enough information for most purposes. For more complex applications, you would need to refer to the 8255 data sheets.

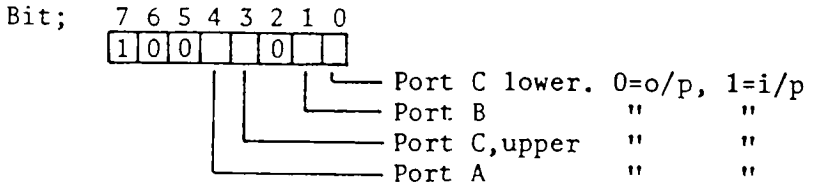
The 8255 has three 8-bit I/O ports (A,B and C), which can be written to (when they are in the output mode) or read from as sigle byte registers. It also has an internal 8-bit control register which can only be written to. In the circuit shown, the addresses of the four registers are;

	Hex	Decimal
Port A	C000	49152
Port B	C001	49153
Port C	C002	49154
Control	C003	49155



It may be set up - by writing special codes to the control register - to one of three modes. Mode 0 is the simplest, and suitable for most applications.

In mode 0, ports A and B may each be set up as 8 input lines or as 8 output lines. Port C is divided into upper and lower 4-bit halves, each of which may be set up to act as input or output. To set up the 8255, we need to write into the control register a byte constructed as;



Thus to set Port A for output, B for input, and both parts of Port C for input, we need to write an 8-bit pattern 10001011 to the Control register.

Remembering that;

If bit 7 = 1	this	corresponds	to	decimal	128
" " 6 = 1	"	"	"	"	64
" " 5 = 1	"	"	"	"	32
" " 4 = 1	"	"	"	"	16
" " 3 = 1	"	"	"	"	8
" " 2 = 1	"	"	"	"	4
" " 1 = 1	"	"	"	"	2
" " 0 = 1	"	"	"	"	1

then we can set up the 8255 by the BASIC statement;

```
POKE 49155, 139      (139 = 128+8+2+1)
```

Having set up the 8255, we can now send a pattern to the output port A by;

```
POKE 49152,X         (X is the pattern; 0-255)
```

The pattern on the 8 input lines connected to the B port can be read by;

```
LET A=PEEK 49153
```

and similarly, all 8 port C inputs can be read by;

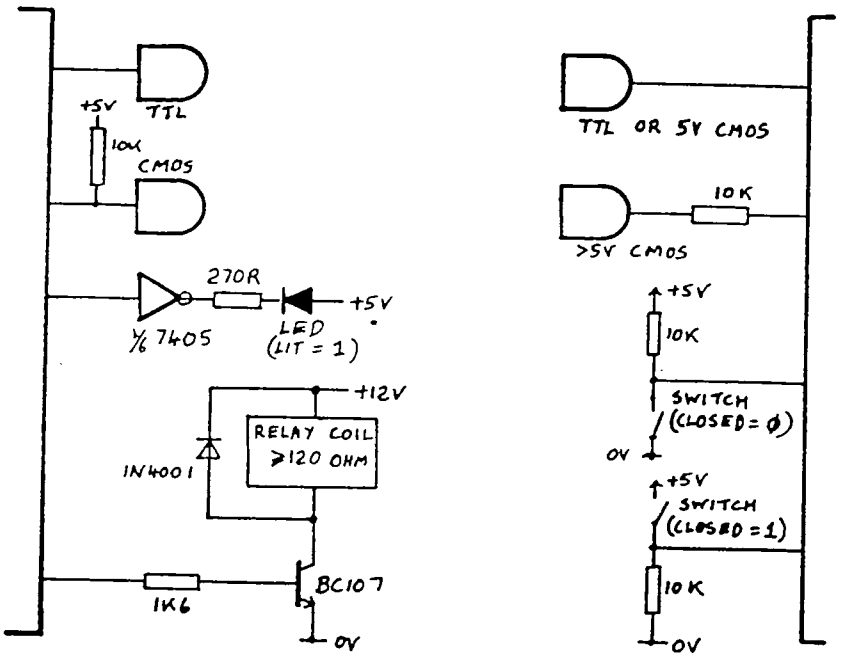
```
LET A=PEEK 49154
```

If either half of the C port has been set up for output, then any of the lines may be set or reset individually at any time by POKEing one of the following values to the Control register;

Value POKEd	Effect
0	PC0 reset to 0
1	PC0 set to 1
2	PC1 reset to 0
3	PC1 set to 1
4	PC2 reset to 0
5	PC2 set to 1
6	PC3 reset to 0
7	PC3 set to 1
8	PC4 reset to 0
9	PC4 set to 1
10	PC5 reset to 0
11	PC5 set to 1
12	PC6 reset to 0
13	PC6 set to 1
14	PC7 reset to 0
15	PC7 set to 0

When set up as output lines, the 8255 outputs can each drive one standard TTL load. When acting as inputs, they present a high

impedance to the driving source, and accept an input voltage of less than 0.8V as a '0', or a voltage between 2.0 and 5.0V as a '1'. Some useful interface circuits are shown below;



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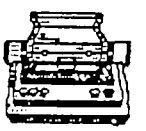

73, K5XY

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